POLLUTANT LOADING ANALYSIS SITE SPECIFIC PROJECT PLAN FOR:

Salmon Falls Headwater Lakes Watershed Management Plan: Implementation (Phase 1) and Road Management Planning for Great East Lake, Lake Ivanhoe, Horn Pond, Wilson Lake, and Lovell Lake
B-10-C-01

Under the New Hampshire Section 319 Nonpoint Source Grant Program QAPP
RFA# 08262
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Signature/Date
Leah O'Neil, EPA R1

1- Distribution List

Table 1 lists people who will receive copies of the approved Site Specific Project Plan (SSPP) under the *New Hampshire Section 319 Nonpoint Source Grant Program Quality Assurance Project Plan* dated October 17, 2008.

Table 1. SSPP Distribution List

SSPP Recipient Name	Project Role	Organization	Telephone number and e-mail address
Linda Schier	Project Manager	AWWA, Executive Director	603-473-2500 info@AWwatersheds.org
Howard Dupee	Program Director and Project QA Officer	AWWA, Program Director	603-473-2500 info@AWwatersheds.org
Sally Soule	NHDES Project Manager	NHDES, Watershed Management Bureau	603-559-0032 sally.soule@des.nh.gov
Jillian McCarthy	Program QA Coordinator	NHDES, Watershed Management Bureau	603-271-8475 jillian.mccarthy@des.nh.gov
Vince Perelli	NHDES QA Manager	NHDES, Planning, Prevention, & Assistance Unit	603-271-8989 vincent.perelli@des.nh.gov
Leah O'Neil	Project Manager	EPA Region1	(617) 918-1633 oneill.leah@epa.gov

2- Project Organization

Figure 1 outlines the organization structure of the project personnel and Table 2 identifies the roles and responsibilities of those individuals involved in the project.

Figure 1. Project Organizational Chart

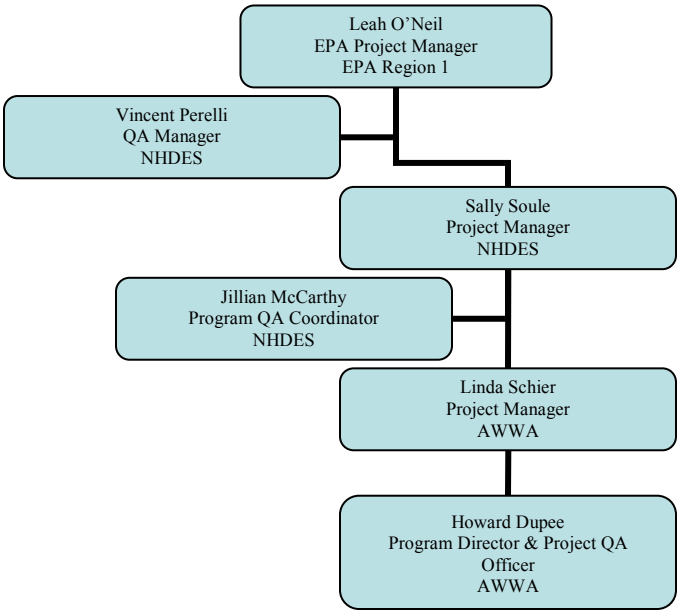

Table 2. Personnel Responsibilities and Qualifications

Name and Affiliation	Responsibilities	Qualifications
Linda Schier, AWWA, Executive Director	Project Manager	On file at AWWA
Howard Dupee, Program Director	Program Director and Project QA Officer	On file at AWWA
Jillian McCarthy, NHDES, Watershed Management Bureau	Reviews QAPP preparation and other QA/QC activities	On file at NHDES
Sally Soule, NHDES, Watershed Management Bureau	Reviews and oversees projects funded by DES 319 Restoration Grants in Coastal basin.	On file at NHDES
Vince Perelli, NHDES Planning, Prevention & Assistance Unit	Reviews and approves SSPPs and QAPPs	On file at NHDES
Leah O'Neil, EPA Region 1	Review and approves SSPPs and QAPPs	On file EPA Region1

3 – Problem Definition/Background

The communities within the Acton Wakefield Watersheds Alliance (AWWA) region are fortunate to have waters of exceptional quality. The natural amenities that make the AWWA region so unique and attractive also make it vulnerable to the impacts of increasing development. For example, according to the Strafford Regional Planning Commission, the Town of Wakefield, New Hampshire has experienced a population growth of nearly 57% from 1990 – 2005 (SRPC 2007). Pollution threats related to development include sediment, nutrients and bacteria from existing and future shoreland development, aging septic systems, and roads in the watershed.

In 2010, AWWA completed a 2-year watershed planning effort to identify actions and programs to protect the region's five high-quality lakes: Great East Lake, Horn Pond, Lake Ivanhoe, Wilson Lake and Lovell Lake. The Salmon Falls Headwater Lakes Watershed Plan provides: 1) A detailed watershed assessment for the five lakes including land use and water quality; 2) A detailed assessment and estimation of the impacts of phosphorus, the main pollutant affecting these lakes; and 3) An Action Plan with community-derived recommendations for Best Management Practices (BMPs), programs, and projects to help protect these valuable waters. To develop the Plan, AWWA analyzed current land uses and phosphorus inputs to the lakes. A build-out analysis was used to estimate future water quality levels based on new development. In order to measure current on-the-ground inputs, AWWA conducted watershed surveys with the help of local citizens to identify specific sites contributing excess phosphorus, the main pollutant of concern, to the project lakes and tributaries. Finally, the project team worked together with Maine and New Hampshire environmental agencies to organize, summarize, and analyze all of the lake water quality data gathered by volunteers and professionals for more than three decades for the project lakes. These data enabled the project scientists to determine the current in-lake status and set phosphorus goals for each of the five lakes.

The AWWA Youth Conservation Corps (YCC) will implement BMPs as recommended in the Plan, in the towns of Acton, Maine and Wakefield, New Hampshire in order to help AWWA and the lake communities meet or exceed the phosphorus thresholds stated in the Plan. The subwatersheds in the project area include the following waterbodies: Great East Lake, Horn Pond, Lake Ivanhoe, Wilson Lake and Lovell Lake. The various lakes and ponds located in the project area reflect the geographic scope of AWWA's Salmon Falls Headwater Lakes Watershed

Plan. These subwatersheds ultimately drain to the Piscataqua River watershed. Due to the soil types and development along the lakes and ponds, soil erosion and the associated sedimentation and phosphorus loading is threatening the quality and uses of the surface waters. The YCC will work with willing landowners to stabilize soils and reduce water quality impacts from stormwater runoff through the construction of appropriate BMPs.

The intent of this project is to improve eroded shoreland areas and preserve the water quality within the waters of Acton and Wakefield while increasing awareness of nonpoint source pollution within the communities. Improvements and preservation of water quality will be achieved through the use and implementation of BMPs to control flow of stormwater runoff, including vegetated buffer zones, roof and driveway runoff management, and meandering walkway designs. There will be additional outreach and education programs for homeowners and municipalities to further highlight BMPs that are simple to construct and maintain.

4 – Project/Milestone Description

During the 2010 and 2011 summer seasons, the YCC will review requests from homeowners for assistance with managing erosion and stormwater runoff. After selecting appropriate projects in accordance with criteria outlined in Section 8, the YCC staff will estimate pollutant load reductions, implement BMPs, and confirm load reductions through field measurements of implemented BMPs to ensure that the modeled project scenario accurately reflects the BMPs installed.

Table 3. Project Schedule Timeline

Activity	Dates (MM/DD/YYYY)		Product	Due Date
	Anticipated Date(s) of Initiation	Anticipated Date(s) of Completion		
SSPP Preparation	3/2010	6/2010	SSPP Document	6/30/2010
Pre-implementation modeling/calculations	7/01/2010	9/2011	Pre-implementation pollutant loading calculations	Prior to BMP installation
Construction of BMPs	7/2010	9/2011	Installed BMPs	End of 2011 construction season
Semi-annual Progress Reports	12/2010	12/2011	Semi-annual progress reports	Twice per year during project period
Post-implementation modeling/calculations	8/2010	10/2011	Post-implementation pollutant loading calculations	Following BMP installation
Data Review and Assessment	7/2010	10/2011	Completed pollutant load estimates for each site	October 2011
Final project report preparation	9/2011	12/31/2011	Final Report	12/31/2011

5 – Quality Objectives and Criteria

The data collected for this project includes data required by the Region 5 Load Estimation Model for Gully Stabilization. The Region 5 Load Estimation Model is an EPA-approved model for Section 319 projects. This model was used to calculate pollutant load reductions for previous AWWA YCC projects (2007, 2008, and 2009). The AWWA determined that this is the most appropriate model for this project during initial project scoping meetings and review of the Model's user manual (Appendix A). The model documentation includes the R5 Load Estimation Model Field Data Entry Sheet – Gully Stabilization form that defines the necessary input data

(see Appendix B). The model gives default values for many inputs in the User's Manual, but requires that the following, site-specific information be collected in the field: top width (ft), bottom width (ft), depth (ft), and length (ft). The approval and endorsement of this model by EPA ensures that the right type, quantity, and quality of data are collected for this project as presented in the Field Data Entry form.

Additional information, including the number of years of gully formation and soil P concentration will be obtained from the homeowner and NHDES respectively. This secondary information is documented in Section 12 - Non-Direct Measurements.

Data collected will meet specifications outlined in the Region 5 Load Estimation Model manual, "Pollutants Controlled Calculation and Documentation for Section 319 Watershed Training Manual," which was prepared by the State of Michigan Department of Environmental Quality.

6 – Special Training/Certification

The field data collected for model input will be collected by the Project Manager, Program Director or YCC Crew Leader. All appropriate staff members are trained in field techniques including site measurement and documentation of site conditions. Training is performed by Maine Department of Environmental Protection staff that use this model on a regular basis. The model is run by AWWA staff, specifically the Program Director. The Program Director reads the manual and receives training from Maine DEP staff. AWWA will record time and content of training attended by staff. Employee training records will be kept on file at the AWWA office.

7 – Documents and Records

The AWWA Project Manager and the Program Director are responsible for ensuring that project personnel have the most current version of the SSPP, including applicable field data forms, the Region 5 Users Manual, and standard operating procedures. AWWA personnel have a supply of the *Region 5 Load Estimation Model Field Data Entry Sheet – Gully Stabilization* ("field data sheet") and place them in a field kit prior to visiting the site for pre-construction and post-construction data gathering. A field data sheet is filled out during each pre- and post-construction site visit. Once all fieldwork is completed, the AWWA Program Director inspects and signs off on each individual field data sheet. Once the field data sheet is signed off, the information on the sheet is used to populate the model (Excel spreadsheet) in the AWWA office by either the Program Director or the YCC Crew Leader. All field data sheets are kept on file with the AWWA Program Director to ensure that the data are always available. AWWA staff keeps a complete set of project files archived at the program's office for a minimum of three years following completion of the project. Other reports including the Nonpoint Source Projects Pollutant Controlled Report, semi-annual progress reports, and final project report are submitted in accordance with the Grant Agreement between AWWA and NHDES.

8 – Project Design (Experimental Design)

The Project Manager, Program Director and YCC Crew Leader select sites for BMP implementation from requests submitted to AWWA by interested property owners. Interest is generated through several venues including communication by AWWA to homeowners, municipal officials, and lake associations. The selection criteria are as follows:

- Sites are selected that have a relatively high impact to water quality, using sediment load estimates and modeling results where possible, and based on recommendations from AWWA watershed survey reports.

- Each erosion control project represents an example of a BMP; therefore efforts are made to choose sites with solutions that will provide examples of a variety of different types of BMPs.
- Efforts are made to include at least one project on each lake in the geographic scope of the watershed plan.
- All other factors being equal, the projects will be visible and accessible to the public for inspection, to more fully raise the awareness of erosion from storm water runoff and encourage other property owners to participate in the solutions.
- The proposed BMP must be able to be implemented using hand tools only.
- All sites are approved and selected by the AWWA YCC Director and the YCC Site Selection Committee of the AWWA Board Directors.

At a minimum 20 sites will be selected for BMP construction. Site selection will be guided by results from AWWA's watershed surveys (see Section 3) and homeowner interest. This will occur over the two-season project period as determined by AWWA in their project proposal submitted to NHDES.

Using the criteria above, the AWWA Program Director determines the suitability of each site. Assistance with issues such as appropriateness of BMP type, size, and placement is provided by the Program Director. The Program Director conducts site visits at each property where an installation is planned. The YCC Crew Leader participates in the site visits and consults with the Program Director to ensure that details of the BMP installation are discussed.

The AWWA also convenes a YCC Site Selection Committee consisting of members from the AWWA Board of Directors. The Site Selection Committee may review the Program Director's site selections and pose questions or propose discussion for any potentially questionable sites. The Program Director sends out periodic emails to the Site Selection Committee members as sites are selected, including a few sentences about the site and how it meets the criteria. If no problems arise from the committee members, the Program Director creates a design and a list of materials. These items are given to the homeowner along with local sources of materials. An agreement, referred to as a Letter of Agreement, between AWWA and each landowner is signed that describes the responsibilities of both parities including needed materials and maintenance requirements.

9 – Model/Equation Methods

The load reduction model used for this project is the Region 5 Load Estimation Model, developed by the State of Michigan Department of Environmental Protection and Illinois EPA. The original version of the model was created in 1999 and was revised in 2002 to include a new worksheet, containing state and county names, correction factors, and the USLE parameter values summarized from the 1997 National Resources Inventory database. In response, two of the original worksheets for Gully and Bank Stabilization were also modified to allow users the option to input site-specific data instead of using default values. The user manual was revised in 2002 by EPA to correspond to changes made to the model (Appendix A).

The Region 5 Load Estimation Model is recommended by EPA and by NHDES for use on Section 319 grant projects. The model is appropriate for this project because it models the primary and secondary pollutants of concern, which are sediments and nutrients. In addition, this is a relatively small-scale, small budget project; it would be inappropriate and unnecessary to use a more input-intensive model. It was determined that the Region 5 Model will adequately assess the load reductions as appropriate for the scale and required accuracy of the project and in sync with the skills level of the organization managing the project. In addition, the Region 5 Model is

used for similar projects in NH and Maine, which will make the model analysis comparable. No modifications will be made to the model for this project.

If problems occur with the model, the NHDES Project Manager will be contacted. If NHDES staff are unable to correct the problem, EPA and Tetra Tech, Inc., the contractor assigned to the STEPL and Region 5 Models, will be contacted for assistance in correcting the problem.

10 – Quality Control

The YCC projects are soil stabilization projects. The BMPs being installed (e.g. water bars, meandering pathways, vegetative buffers) filter sediments and associated nutrients before entering nearby lakes and ponds. BMP inspections include a visual inspection by the Program Director to ensure that the BMPs were installed properly and are functioning as designed. This inspection occurs after a rainfall event that results in significant runoff. This includes no visible sediment deposition into the waterway and no visible signs of erosion or transport of sediment. If the visible inspection shows that the BMPs are not performing as designed, the Program Director records the failures in a notebook and has the YCC Crew Leader and field crews correct the construction. An additional inspection occurs following a significant rain event subsequent to the repairs or modifications. BMP installations are photo documented using the NHDES Photo Documentation Procedure for Measuring the Success for Restoration Projects and Best Management Practices (on file at NHDES).

The Region 5 Load Estimation Model will be used for this project. The data collected for input into the model is collected in accordance with the Field Data Entry Sheet (Appendix B) provided with the model. The data sheet is checked for completion prior to leaving the site. When running the model a second person verifies the input values to prevent transcription errors. In addition, a duplicate run, conducted by a second modeler, is done each time the model is used. This will further reduce transcription errors and ensure proper estimates. The two AWWA staff, Project Manager and Program Director, perform these tasks. If transcription or model errors are identified, the Program Director corrects the error or, if unable to correct the error, consults with the NHDES Project Manager or Tetra Tech staff for assistance. Project staff will check the EPA--TetraTech Region 5 model web site for updates to the model or field sheets prior to conducting field work and/or running the model (http://it.tetratechffx.com/stepl/models$docs.htm).

11 – Inspection/Acceptance of Equipment and Materials

The only materials to be purchased for the projects are acquired by the property owners. A list of materials needed for the project is provided to the homeowner by the Program Director when the Letter of Agreement is discussed (see Section 8). Typical materials include various sized stone, mulch, small shrubs, timbers, and pavers. The materials are inspected by the Program Director and YCC Crew Leader to make sure they are appropriate for the project and of sufficient quantity to complete the installation. All tools are property of AWWA. AWWA staff inspects all tools prior to use and are responsible for repair or replacement if necessary.

The Region 5 Loading Estimation Model is available to the public for download from the EPA website. Any problems with the model will be reported to EPA and Tetra Tech, Inc., the contractor assigned to the STEPL and Region 5 Models.

12 – Non-Direct Measurements

Historical information is obtained from the homeowner to determine the number of years that the erosion has occurred. This information is used to run the model. The NHDES provides information on soil P concentration. All other model inputs use default values provided in the Region 5 Model User Guide (Appendix A).

The homeowners, AWWA, NHDES, Michigan DEP, and EPA are trusted data sources sufficient to meet the needs of this project. Therefore, all data are considered to be of acceptable quality because of their sources. Any limitations to the data that are determined are noted.

13 – Data Management

All field data sheets are kept on file at the AWWA office, which is located at 254 Main Street in Wakefield, New Hampshire. The AWWA computer is used to upload the model and store calculation results. Refer to Section 10 for a description of the quality control checks.

14 – Assessments and Response Actions

The Region 5 Model User Manual (Appendix A) is followed to ensure proper load reduction estimates. The Field Data Entry sheet for Gully Stabilization is filled out in its entirety to ensure that all necessary input data is obtained prior to running the model. As described in Section 8, a second person verifies the data input values in the model to check for transcription errors and a second person runs the model duplicate to ensure proper estimates.

Proper field measurements are taken to ensure that the modeled project scenario accurately reflects the BMP installed.

The AWWA Project Manager and NHDES Project Manager are responsible for oversight and work cooperatively to manage corrective actions, if necessary.

15 – Reports to Management

The project records all YCC BMP construction projects with before and after photographs and written descriptions. Semi-annual progress reports and a final report are filed by the AWWA Project Manager. Semi-annual progress reports are due at the end of December and June. The final report follows guidelines provided by the NHDES Project Manager and these reports typically include project successes and failure, final budgets, evaluation and pollutant load reductions. The Program Director annually submits a Nonpoint Source Projects – Pollutant Control Report to the AWWA Project Manager who reviews it and submits it to NHDES.

16 – Data Evaluation of Load Reduction Estimates

The pre-implementation loading estimates are compared to the post implementation measurements to determine the load reductions achieved.

17 – Evaluation and Project Success

The project is successful if the project milestones listed in Section 4 are completed. In addition, the entire AWWA YCC project is considered successful if the milestones in the NHDES and AWWA Grant Agreement are met.

References

Michigan Department of Environmental Quality Surface Water Quality Division Nonpoint Source Unit. *Pollutants Controlled Calculation and Documentation for Section 319 Watersheds Training Manual.* June 1999. (revised 2002).

Acton Wakefield Watersheds Alliance. *Salmon Falls Headwater Lakes Watershed Plan*. March 2010. (draft).

Appendix A Region 5 User's Manual Pollutants Controlled Calculation and Documentation for Section 319 Watersheds Training Manual

(On file at AWWA office and NHDES Pease Field Office)

Appendix B Region 5 Load Estimation Model Field Data Entry Sheet – Gully Stabilization

(On file at AWWA office and NHDES Pease Field Office)